

PROCEEDINGS  
OF THE  
BIOLOGICAL SOCIETY OF WASHINGTON

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AN ELUCIDATION OF THE NEOTROPICAL GENUS  
*CHINAIA* WITH A KEY TO MALES AND A NEW  
ALLIED GENUS

[Homoptera: Cicadellidae: Neocoelidiinae]

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In an earlier paper (1958 Proc. Biol. Soc. Wash. 71:69-74), I described six new species of the genus *Chinaia* from Central America and included a check-list of the species assigned to or described in this genus. All of the species enumerated in the check-list have now been studied. Many of the species are known from uniques which necessitated the study of types. This study was made possible through the very kind cooperation of the following entomologists: W. E. China of the British Museum, G. E. Wallace of the Carnegie Museum in Pittsburgh, and R. Linnavuori of Turku, Tyttölyseo, Finland.

Of the thirteen species included in my original check-list, eleven are now considered to be members of *Chinaia*. One of the eleven is known only from a partly mutilated female and its inclusion is, perhaps, questionable. One of the two species now excluded from *Chinaia* has been referred to *Coelidiana*, while the other appears to be a deltocephaline with uncertain generic affinities. In the course of this study, two new species representing a new genus closely allied to *Chinaia* were discovered. This paper, then, treats *Chinaia*, the species removed from *Chinaia*, and the new closely related genus with its two new species. A revised check-list of *Chinaia* is also included.

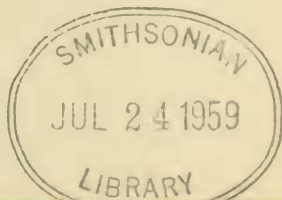
*Chinaia* Bruner and Metcalf

1934. Bull. Brooklyn Ent. Soc. 29(3):120.

Type of genus *Chinaia bella* Bruner and Metcalf.

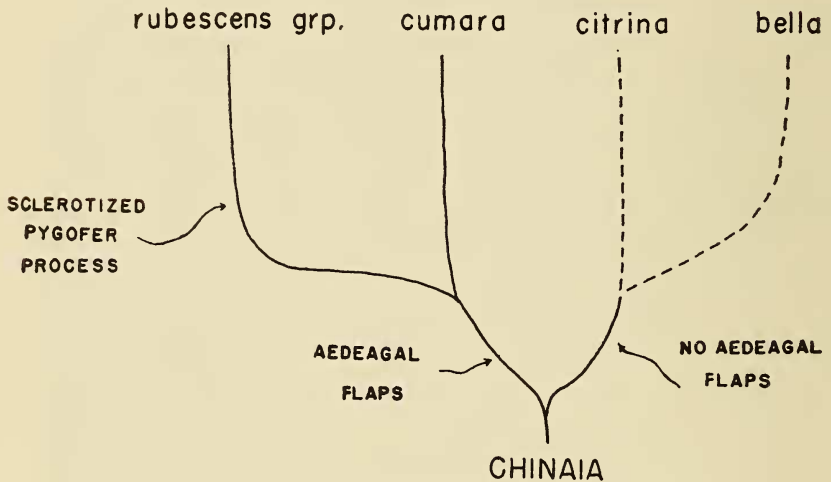
Head narrower than pronotum and broadly rounded anteriorly, length of crown much less than basal width between the eyes. Anterior margin of head without a carina. Ocelli on face at a considerable distance below anterior margin of head. Clypellus much wider distally than basally. Antennae as long or longer than the body. Pronotum much wider than long. Scutellum very large and triangular, as long as pronotum. Venation obscure except at apex of the long tegmina.

Coloration yellowish to pale orange with extensive orange to bright red orange markings. Dark brown markings often found on clavus and apical portion of tegmina.



Male genitalia. Valve quite obscure in uncleared specimens. Plates deep and scoop-shaped. Pygofer either with dorsal processes or an elongation of terminus. Connective cruciform, not fused with aedeagus. Aedeagus moderately straight or recurved with gonopore opening apically or dorso-apically, except in *bella* where the opening is at the distal portion of the shaft. Aedeagus with or without lateral flaps.

The genus *Chinaia* as presently interpreted includes species which exhibit rather diverse genitalic patterns. Even though some splitting of the genus could be justified on the basis of these divergences, it is believed that little would be accomplished by so doing at this time. Females which are presently unrecognizable to species would then be unrecognizable to genus.



Proposed phylogeny of the genus *Chinaia*

The known species of *Chinaia* fall into two groups based upon the presence or absence of the aedeagal flaps. Those species with the aedeagal flaps form two lines. One of these lines is represented by a single species *cumara* in which paired processes have developed between the aedeagus and flap; while the other line, containing most of the species in the genus, has evolved a distinct sclerotized dorsal pygofer process.

The group which lacks the aedeagal flaps is represented by two species: *bella* and *citrina*. Here the pygofer has elongated and exceeds the male plates. On the basis of the aedeagus, these two species are not very close and probably represent distinct branches. In *bella* the gonopore is located at the distal portion of the broadly recurved tip. In *citrina* the gonopore is at the apex of the slender U-shaped shaft.

The key which follows will allow separation of the males. The females on hand are not associated with males, except in one case, and are not treated at this time.

*Chinaia*: Key to Males

1. Pygofer in lateral view with a distinctly sclerotized dorsal process 2  
 Pygofer in lateral view with terminus prolonged or modified without  
 sclerotized process ..... 8
2. Pygofer process approximately "S" shaped (fig. E2)\* ..... 3  
 Pygofer process variously formed but not "S" shaped ..... 4
3. Proximal portion of clavus concolorous..... *caprella* Kramer  
 Proximal portion of clavus with an orange stripe *permista* Kramer
4. Pygofer process elongate caudad and decurved ..... 5  
 Pygofer process neither elongate caudad nor decurved ..... 7
5. Pygofer process bifurcate at apex (fig. D2)\* ..... *bifurcata* Kramer  
 Pygofer process entire at apex ..... 6
6. Pygofer processes in dorsal view straight, terminating with incurved  
 hooks (Plate I, fig. 13) ..... *agarista* Kramer  
 Pygofer processes in dorsal view curved outward and without hooks  
 (Plate I, fig. 12) ..... *rubescens* (Fowler)
7. Aedeagus in lateral view narrowed on distal one-half (fig. C3)\* .....  
 ..... *lepida* Kramer  
 Aedeagus in lateral view narrowed on distal three-fourths (Plate I,  
 fig. 7) ..... *ornata* (Osborn)
8. Aedeagus with paired basal accessory processes (fig. A3)\* .....  
 ..... *cumara* Kramer  
 Aedeagus without processes ..... 9
9. Pygofer terminus undulate and hooked (Plate I, fig. 1) .....  
 ..... *bella* Bruner & Metcalf  
 Pygofer terminus expanded and then narrowed at apex (Plate I,  
 fig. 8) ..... *citrina* Evans

\*These fig. numbers refer to illustrations which appeared with the original description in 1958 Proc. Biol. Soc. Wash. 71: 69-74. All of the authors species are treated in this earlier paper.

*Chinaia rubescens* (Fowler)

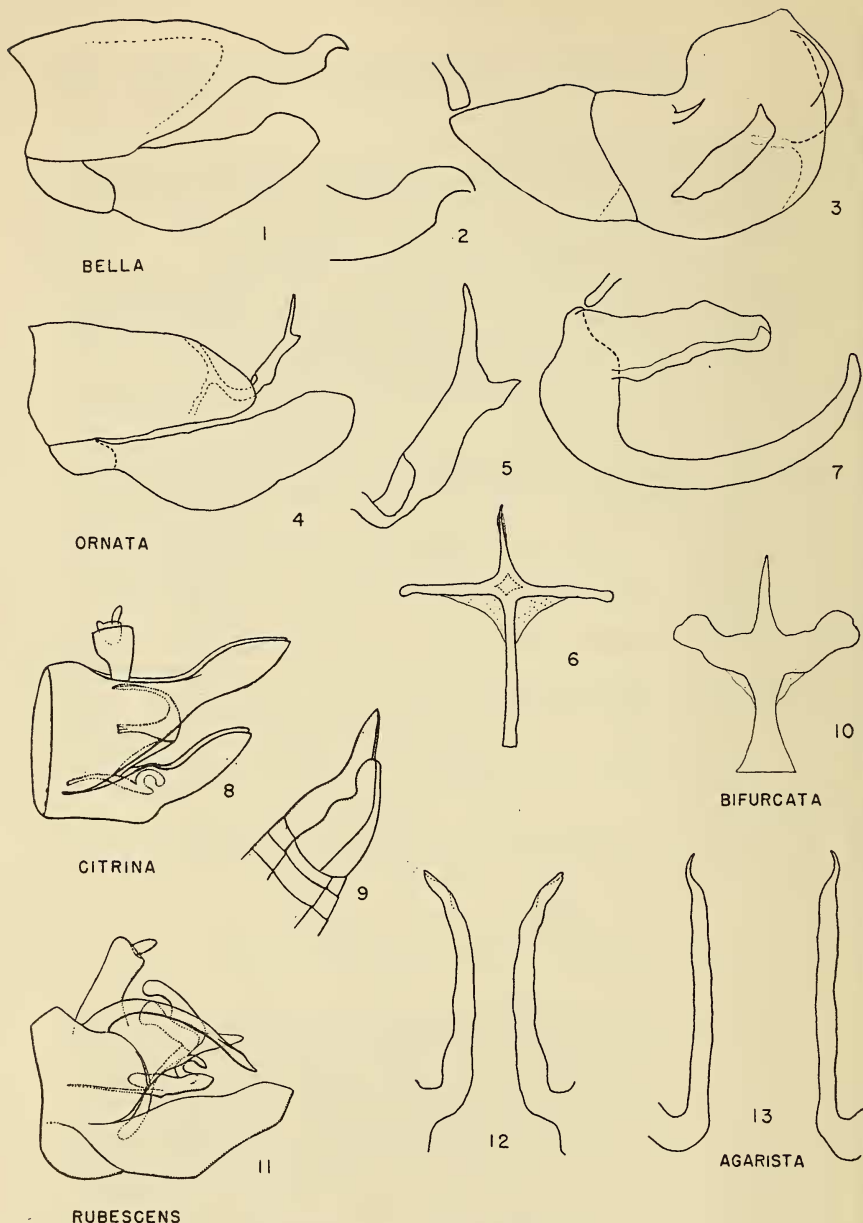
1900 *Tettigonia rubescens* Fowler, *Biologia Centrali-Americana* 2: 282-283, with illustration in color Tab. 19, fig. 7.

Fowler's original description is quoted here: "Pale testaceous, with the base and sides of the pronotum, a broad band on the tegmina, and sometimes the apical portion of the scutellum, red, the red band on the tegmina occasionally covering the whole of the corium except the apex; head short, but longer than the pronotum, which is very short, scarcely produced before the eyes and broadly subtruncate, eyes prominent; tegmina much narrowed toward the apex; legs light testaceous-yellow. Long. 7-8 millim.; lat. 2-2½ millim. Hab. Panama, Volcan de Chiriqui 2500 to 4000 feet (Champion.)"

Male genital structures. (Pl. I, figs. 11-12) Pygofer process long and spearlike, almost identical to *agarista* in lateral view. In dorsal view the pygofer process is curved laterally without terminal hooks. The aedeagus is like that of *agarista*.

Specimens studied. Two males and one female with data; San Isidro del General, Costa Rica, D. L. Bounds. No dates when collected.

The identity of this species is based upon a male paratype located in the British Museum bearing same collection data as the type specimen



BELLA

ORNATA

CITRINA

RUBESCENS

BIFURCATA

AGARISTA

Plate I *Chinaia*

*C. bella* [1-3] 1. lateral view of pygofer, valve, and male plate. 2. enlarged pygofer extension. 3. lateral view of aedeagus. *C. ornata* [4-7] 4. lateral view of pygofer, valve, and male plate. 5. enlarged pygofer process. 6. ventral view of connective. 7. lateral view of aedeagus. *C. citrina* [8-9] 8. lateral view of whole genital capsule. 9. three-quarters view of genital capsule. *C. bifurcata* [10] 10. ventral view of connective. *C. rubescens* [11-12] 11. lateral view of whole genital capsule. 12. dorsal view of pygofer processes. *C. agarista* [13] 13. dorsal view of pygofer processes.

which is a female. Dr. W. E. China sketched the genitalia and his drawing is used here. *C. rubescens* and *C. agarista* are very close species and can be distinguished with certainty only by the shape of the pygofer process in dorsal view as indicated in the key. Unfortunately the male paratype of *C. rubescens* has been mounted on a slide in lateral view which does not allow a dorsal observation to be made. However, the specimens which I have studied agree in certain other details with the *C. rubescens* paratype. These details are the curvature of the pygofer process in lateral view and the absence of dark brown markings on the clavus and apical cells. The drawings of the pygofer processes were made from Costa Rican specimens.

*Chinaia ornata* (Osborn)

1924 *Neocoelidia ornata* Osborn, Ann. Carnegie Museum 15 (4):449.

The original description is quoted as follows: "Head short, scarcely produced, narrower than pronotum; vertex wider than long, as long at middle as next the eye; ocelli considerably below the middle of the eye, three times their diameter from the eye; antennae extremely long, longer than entire insect, the outer part of the setae very delicate and irregularly bent and twisted; front somewhat inflated, narrowed abruptly at tip; clypeus short, scarcely longer than wide, widening toward tip, apex truncate; lorae broad, approaching border of cheek; cheeks broad. Pronotum short, one-half longer than vertex, lateral borders curved, hind border faintly sinuate; elytra long, narrowing to apex, appendix narrow. Genitalia: male, plates short, tumid; tips compressed, and bluntly rounded.

Light yellow, with the hinder border of pronotum and cheek, lateral and apical portion of scutellum, a broad discal and apical spot on clavus, an elongate basal spot on corium, a transverse discal spot from sub-costa to claval suture touching apical spot on clavus, two somewhat oblique spots on anteapical cells, orange-red; a darker orange band bordered with fuscous on anteapicals; four blackish dots on apical veins; apical areoles smoky; wings milky subhyaline. Beneath, pale creamy; tarsal claws dusky.

Length: 6.75 mm.

This very ornate species is represented by a single specimen from Valparaiso (2500 ft.) Dept. of Magdalena, Colombia, July, 1898, C. M. Acc. No. 1999 (H. H. Smith coll.)"

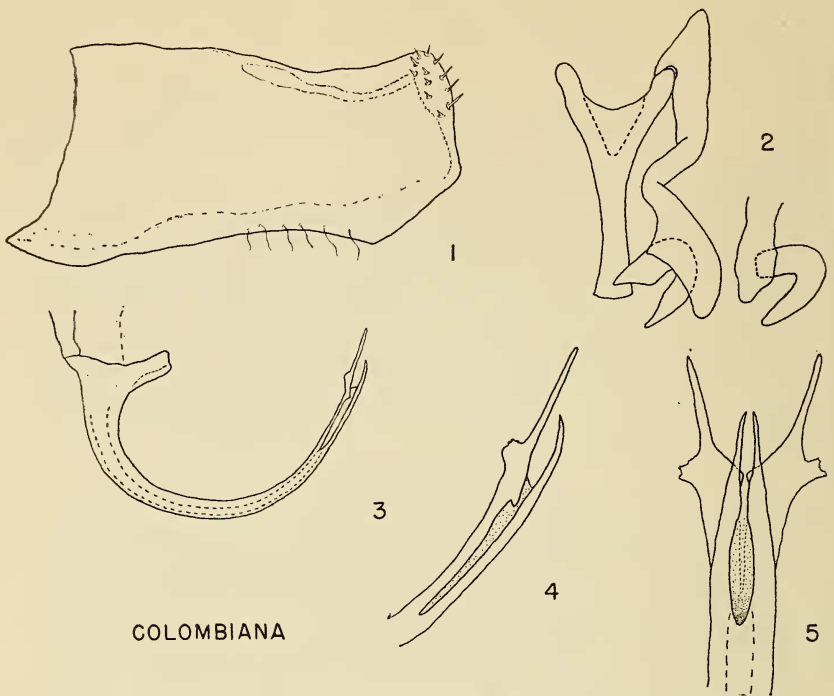
Male genital structures. (Pl. I, figs. 4-7) Pygofer process erect, rather slender with a large tooth on posterior margin and narrowed apically. Aedeagus in lateral view recurved with shaft narrowed. The drawings were made from the type specimen which was generously loaned through the courtesy of Dr. G. E. Wallace and the Carnegie Museum of Pittsburg.

*Chinaia bella* Bruner and Metcalf

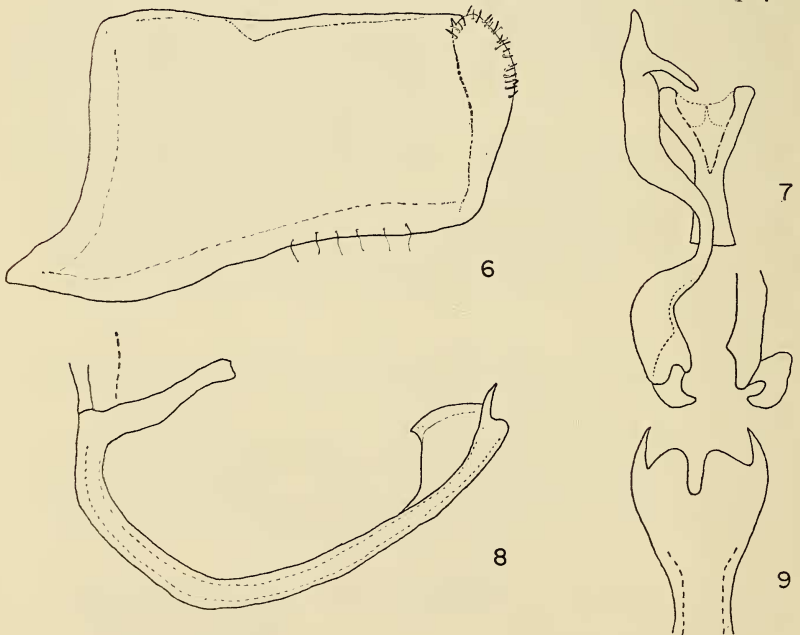
1934 *Chinaia bella* Bruner and Metcalf, Bull. Brooklyn Ent. Soc. 29(3): 121-122.

This species was thoroughly treated in the original description both verbally and pictorially. Sufficient to say that *bella* has the same general habitus as the other members of this genus and can only be identified satisfactorily on the basis of the male genitalia.

Male genital structures. (Pl. I, figs. 1-3) As indicated in the key, the



COLOMBIANA



YOUNGI

Plate II *Xenocoelidia*

*X. colombiana* [1-5] 1. lateral view of pygofer. 2. ventral aspect of connective and style (only one drawn) also apex of style in lateral view. 3. lateral view of aedeagus. 4. enlarged lateral view of aedeagus apically. 5. direct caudal aspect of aedeagus apically. *X. youngi* [6-9] 6. lateral view of pygofer. 7. ventral aspect of connective and style (only one drawn) also apex of style in lateral view. 8. lateral view of aedeagus. 9. direct caudal aspect of aedeagus apically.

pygofer is prolonged distally, undulate with an apical hook. The aedeagus is massive and broadly recurved apically. Unlike the other members of the genus the gonopore opens at the distal portion of the shaft. The drawings used here were prepared from a specimen taken from the type series.

*Chinaia citrina* Evans

1947 *Chinaia citrina* Evans, Trans. Royal Ent. Soc. London 98(6):254.

Evans's description is quoted here: "Length 8 mm. Head yellow, antennae orange, eyes dark brown. Thorax: pronotum medially yellow, the remainder orange. Scutellum orange. Tegmen yellow with transverse and longitudinal orange markings and with two large oval, and a few small brown markings adjacent to apex. Thorax, ventral surface yellow. Abdomen, ventral surface orange.

Type male from Essequibo River, British Guiana (Oxford University Expedition ix. 29)."

Male genital structures. (Pl. I, figs. 8-9) The terminus of the pygofer is elongate. This elongation is widest near the middle, narrowed at the base and apex which is pointed. The shaft of the aedeagus is greatly narrowed and recurved.

Dr. W. E. China very kindly dissected the type specimen and prepared the drawings which are used in this paper.

*Chinaia smithii* (Baker)

1898 *Neocoelidia smithii* Baker, Canadian Ent. 30:291-292.

*C. smithii* is known from a single female. The type has the tegmina missing. Even though this species has the general habitus of a *Chinaia*, the exact generic placement remains in doubt until males are available for study. The original description is included here:

"Female. Length 8 mm. Pale yellowish with faint touches of reddish on sides of front, pronotum, scutel, and along commissural margin of clavus. Elytra shining yellowish, subhyaline, with four dark spots on inner margin, three on clavus and one beyond; with a complete transverse decoloured band before transverse nervures, which is edged before near costa with a dash of red; with another partial decoloured band beyond transverse nervures which is edged near costa with fuliginous. Costal margin of elytra and first sector of wings greenish. Wing subhyaline, with a median row of three fuliginous spots; veins pale brown, excepting first sector. Last ventral segment but little longer than preceding, hind margin truncate, with the lateral angles somewhat produced.

Described from a single specimen from Brazil."

Revised check-list of species of *Chinaia*

1. *agarista* Kramer, 1958. Proc. Biol. Soc. Wash. 71:74—Panama.
2. *bella* Bruner and Metcalf, 1934. Bull. Brooklyn Ent. Soc. 29(3): 121—Costa Rica.
3. *bifurcata* Kramer, 1958. Proc. Biol. Soc. Wash. 71:71—Panama.
4. *caprella* Kramer, 1958. Biol. Soc. Wash. 71:71—Panama and Canal Zone.
5. *citrina* Evans, 1947. Trans. Royal Ent. Soc. London 98(6):254—British Guiana.
6. *cumara* Kramer, 1958. Proc. Biol. Soc. Wash. 71:73—Guatemala.

7. *lepida* Kramer, 1958. Proc. Biol. Soc. Wash. 71:73-74—Canal Zone.
8. *ornata* (Osborn), 1924. Ann. Carnegie Museum 15(4):449—Colombia.
9. *permista* Kramer, 1958. Proc. Biol. Soc. Wash. 71:71-72—Canal Zone.
10. *rubescens* (Fowler), 1900. Biologia Centrali-Americana 2:282-283—Panama and Costa Rica.
11. *smithii* (Baker), 1898. Canadian Ent. 30:291-292—Brazil.

Species removed from *Chinaia*

*Coelidiana undata* (Linnavuori) new combination

1956 *Chinaia undata* Linnavuori, Ann. Ent. Fenn. 22(1):35.

The original description is as follows: "Length 7 mm. Face and under surface pale yellow, vertex, pronotum and scutellum orange-yellow, base of the latter bordered with black and apex with two large black spots. Elytrae yellow, clavus with a black undate stripe (as in *Platymetopius undatus* DeG.), other parts of the clavus reddish, basal margin black. The 1st and 2nd apical cells smoky brown, bases of 3rd and 4th apical cells with a broad black-brown transverse band, and furthermore two large round black spots at the upper cross-veins. Abdomen orange-yellow, legs yellow. Brazil: Nova Teutonia 16 VIII 1938."

Through the courtesy of Dr. R. Linnavuori, a paratype male was made available for study. It is clearly not a *Chinaia* but belongs to *Coelidiana*. DeLong's paper (1953 *Lloydia* 16(2):93-131), in which many of the Neocoelidiinae are treated, keys out this genus. On the basis of genitalia, *C. undata* greatly resembles *C. bidentata* (illustrated in DeLong's paper pl. 8 fig. 4). However, in *C. undata* the pygofer is shorter and has but one ventral tooth, while *C. bidentata* has two teeth. Further, in *C. undata* the carina separating the crown and face is very distinct; and while distinctly produced, the anterior margin of the head is broadly rounded in dorsal view. The head of *C. bidentata* has a less distinct carina and is rather bluntly pointed. The color patterns of the two species are very different as indicated in the descriptions.

*Neocoelidia punctata* Osborn

1923 *Neocoelidia punctata* Osborn, Ann. Carnegie Museum 15(1):77-78.

Study of the type of this species reveals that this is not a *Chinaia* but actually belong to the leafhopper subfamily Deltocephalinae with generic placement uncertain. Osborn's *punctata* lacks the ledge above the antennal pit which is characteristic of all Neocoelidiinae and has styles typical of many deltocephalines.

*Xenocoelidia* new genus

Type of genus *Xenocoelidia youngi* new species.

Resembles *Chinaia* but differs in shape of clypellus, position of ocelli, modification of male pygofer, and shape of both the connective and styles.

Head either nearly as wide as pronotum or distinctly narrower and broadly rounded anteriorly, length of crown much less than basal width between eyes. Anterior margin of head without a carina. Ocelli on margin of vertex and visible in dorsal aspect. Clypellus very slightly expended before apex. Both clypellus and clypeus rather tumid. An-



tennae as long as body. Pronotum much wider than long. Scutellum very large and triangular, as long as pronotum. Tegmina long with venation obscure except at apex.

Coloration whitish to yellowish with or without brown, yellow, or red markings.

Male genitalia. Valve obscure in uncleared specimens. Plates deep and scoop-shaped. Pygofer lacking processes or lobes. Terminus of pygofer slightly thickened, bearing setae. Connective Y-shaped and closely associated with the aedeagus but not solidly fused. Style long and slender with a mesal curvature. Aedeagus slender and broadly U-shaped. Gonopore apical or subapical.

*Xenocoelidia youngi* new species

Length male 8 mm.

Head narrower than pronotum. Lorum as large as clypellus. Ground color a uniform ivory white. Apex of tegmina bright yellow hyaline. Tiny fuscous spot at tip of each clavus and a very slight darkening at center of commissural margin.

Male genitalia. (Plate II, figs. 6-9) Aedeagus slender and curved dorsally, apex in lateral view with a sharp tooth and an acute blade-like dorsal expansion. Gonopore opens apically.

HOLOTYPE male, Buenaventura, Colombia, 1941, C. L. Fagan. U.S.N.M. type no. 64572. Female unknown. This species is named for one of the world's foremost students of the Cicadellidae, Dr. David A. Young, Jr.

*Xenocoelidia colombiana* new species

Length male 7 mm.

Head slightly narrower than pronotum. Lorum smaller than clypellus. Ground color whitish. Scape and basal half of pedicel bright pink. Anterior margin of head with a pale yellow band below and a bright orange band above. Pronotum with lateral margins and an irregular broadly U-shaped marking centrally located near anterior margin, bright orange. Claval suture with a pale yellow band becoming obscure distally. Clavus with a moderately broad somewhat dusky orange stripe running along scutellum and commissural margin. A brown spot flanks stripe laterally before apex of each clavus. Apex of tegmina brown hyaline.

Male genitalia. (Plate II, figs. 1-5) Aedeagus slender and curved dorsally, split apically in lateral view. Gonopore subapical on venter of shaft.

HOLOTYPE male, Puente Licio, Guasea-Gachetá, Cundinamarca, Colombia, Feb. 20, 1942, Edward A. Chapin, sweeping herbage. U.S.N.M. type no. 64573. Female unknown. Dr. Chapin supplied this additional information: Puente Licio is a bridge across a small stream that crosses the main highway running between Guasea and Gachetá, on the east slope of the Cordillera Oriental.